SERIOUS ACCIDENTS WORLDWIDE

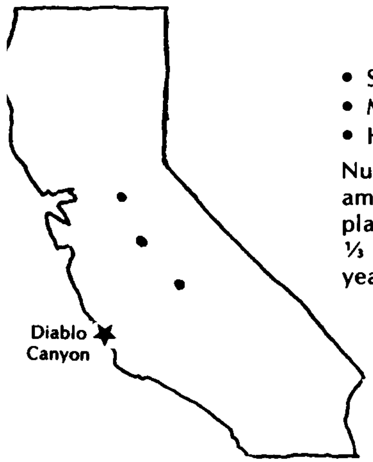
IN 1975, TWO NUCLEAR REACTORS IN ALABAMA CAME WITHIN MINUTES OF MELTDOWN.

HUNDREDS OF PEOPLE WERE KILLED IN A MAJOR NUCLEAR ACCIDENT IN ITALY.

A PARTIAL MELTDOWN IN ENGLAND CONTAMINATED THE MILK SUPPLY OVER A 200 SQUARE MILE AREA.

AND A SOVIET BREEDER REACTOR CAUSED THE DEATHS OF OVER 1,000 PEOPLE.

THE HEAD OF A CONGRESSIONAL TASK FORCE HAS CONCLUDED THAT "AN ACCIDENT SUCH AS OCCURRED AT TMI NOT ONLY COULD HAPPEN AGAIN, BUT IS LIKELY TO AT ANY TIME, ANYWHERE."



FUTURE NUCLEAR SITES IN CALIFORNIA

- Stanislaus
- Madera
- Hanford

Nuclear plants use tremendous amounts of water for cooling. Each plant will use the equivalent of ⅓ of the California aqueduct yearly.

NUCLEAR WASTES

Even if nuclear power were perfect, we would still have nuclear proliferation.

Nuclear wastes will remain hot and radioactive for hundreds of thousands of years. Because there are no satisfactory nuclear waste storage systems, nuclear plants now store their own waste in "ponds", awaiting the development of long-term solutions.

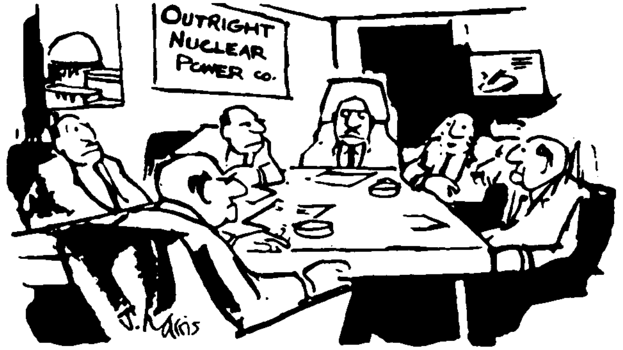
Burial sites for nuclear wastes in Tennessee, containing low-level nuclear materials, are now seeping outward to surrounding farmlands. At the waste storage site in Rocky Flats, Colorado, radioactive wastes are being windblown from corroding canisters; and at one of the oldest waste storage sites in the country, the Hanford, Washington facility, hundreds of thousands of gallons of liquid wastes have leaked out, polluting the Columbia River (and the Pacific Ocean) and contaminating the water supply of nearby residents. Since nuclear power plants have been used as temporary storage sites, they too are now leaking. The Boston Globe has reported that "Radioactive gases or liquids have been accidentally released from New England's seven nuclear power plants more than two dozen times in the past 30 months."

Waste storage is not the only problem. The Union of Concerned Scientists estimates that one of six uranium miners will die of cancer because of overexposure to radon gas. Uranium mine tailings have been responsible for the deaths and sickness of Indians in New Mexico. Tens of thousands of gallons of radioactive wastes have spilled on our highways from numerous transportation accidents; and fallout from nuclear bomb tests have increased leukemia levels 10-15 times the normal rate in Utah and Nevada.

Krypton, xenon, radon, plutonium, iodine, cesium and Strontium-90 are only some of the radioactive products of fission reaction. Most of these radioactive elements, when accidentally released into the biosphere, deposit in human bodies either directly or through the food chain in a process called biological magnification. For example, radioactive materials fall to the ground, accummulate in plants, become concentrated in animals and then further concentrated in man. As such material accummulates in the body, arthritis, blood disorders and cancers will result.

Dr. John Gofman has calculated that even with a "storage reliability of 99.99%, an average of five hundred thousand extra lung cancer deaths per year can eventually be expected" from plutonium alone.

We have reached an evolutionary turning point. Thousands of tons of radioactive materials released through explosions, reactor spills, transportation accidents, leaking plants and waste storage tanks are now escaping into the biosphere. These nuclear materials, which remain radioactive for thousands of years, will continue to accummulate; and eventually their effects on the biosphere and human beings will be grave. According to Helen Caldicott, M.D., "Many people have already died of nuclear related cancers and many more will begin to develop and die of cancer; or their productive genes will mutate, resulting in an increased incidence of congenitally deformed and diseased offspring — not just in the next generation, but for the rest of time."



"First we have to convince the people that good health isn't everything."

ALTERNATIVES TO NUCLEAR POWER

(Discussed thoroughly in another pamphlet)

1.) **CONSERVATION** doesn't mean shivering in the dark. It means making cars, machines, appliances and houses more energy efficient.

2.) **SOLAR ENERGY** includes solar heating and cooling and the conversion of sunlight to electricity with photovoltaic cells.

3.) **COGENERATION** is converting waste energy from industry into direct space heating or electricity.

4.) **WIND POWER** is a fully developed method of producing electricity from wind.

5.) **BIOMASS CONVERSION** involves the changing of organic wastes — garbage and sewage — into useful fuels similar to natural gas — and into alcohol for use in cars.

In testimony before the House Senate Joint Committee in March, 1978, the Council of Economic Priorities stated that the combined use of conservation and solar would create 270% more jobs than nuclear and would produce or save 206% more energy than nuclear, all at a lower cost.

WHAT YOU CAN DO!

Communicate your opposition to the opening of Diablo Canyon and the continuing development of nuclear power by writing letters to PG&E and your local, state and federal government representatives.

Nuclear Regulatory Commission
Attention Director
California Blvd.
Walnut Creek, CA 94596

Governor Jerry Brown
State Capitol
First Floor
Sacramento, CA 95814

- -

☐ I am interested in having someone speak at my civic neighborhood group.

☐ I am interested in receiving more information about nuclear power and the alternatives to nuclear power. (Please donate for printing costs.)

☐ I would like to become directly involved with a local group.

☐ I would like to donate $__________ for a nuclear-free future.

Name ______________________________

Address ______________________________

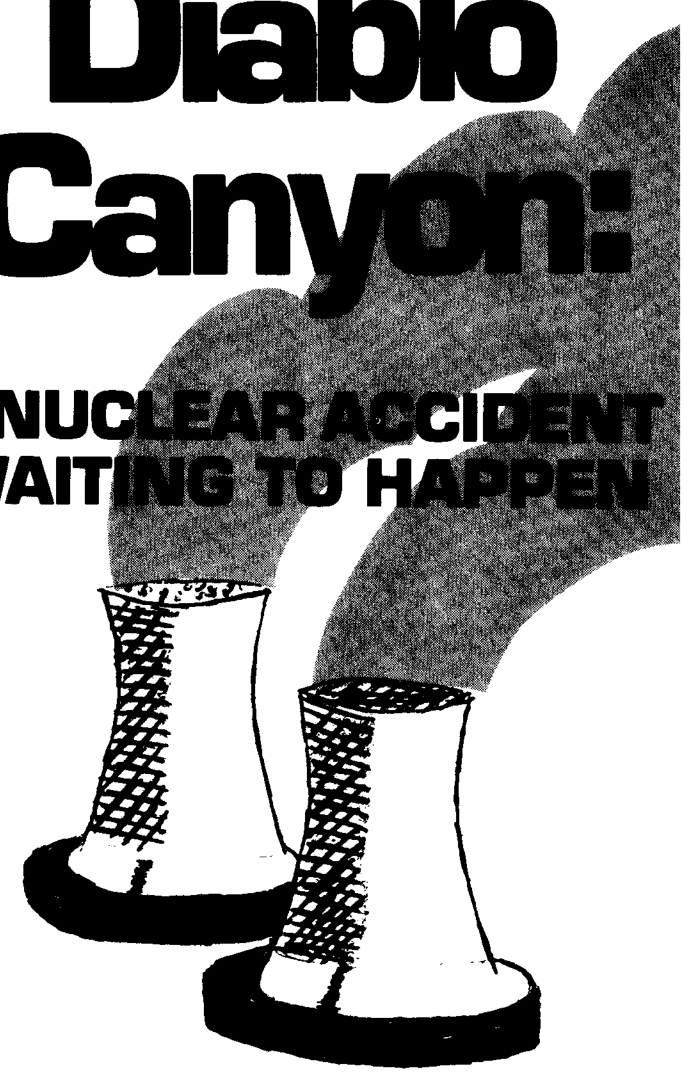
City ____________________ State ______ Zip __________

Phone ______________________________

Please return to:

Or to the **Abalone Alliance, 944 Market St., Room 307**
San Francisco, CA 94102

Diablo Canyon:



A NUCLEAR ACCIDENT WAITING TO HAPPEN

Dr. Richard Hubbard, G.E. nuclear engineer for 25 years:
"Nuclear power now threatens the very existence of life on this planet."

John Pollard quit the Nuclear Regulatory Commission because
"Nuclear power is an accident waiting to happen."

Dr. George Wald, physicist and Nobel prize laureate:
"Any level of radiation causes cancer."

Joseph Hendrie, Chairman of the Nuclear Regulatory Commission:
"We are like a couple of blind people, stumbling around in the dark making decisions."

Dr. John Gofman, nuclear physicist, discoverer of U-233 and former associate director of the Lawrence Radiation Lab.:
"The nuclear industry is a tremendous deception to the American public. The billions of dollars we have invested in nuclear programs should not be considered when health, life, and genetic heritage are at stake."

DIABLO CANYON: A NUCLEAR ACCIDENT WAITING TO HAPPEN *is the second of a four-part series on nuclear power. Altogether, we attempt to show the high cost of nuclear power, the dangers to human life and health, and the potential for irreversible contamination of the environment. More and more people are discovering how dangerous nuclear power is. Many nuclear scientists and engineers have quit the industry after realizing these dangers. Scientific studies show that radiation causes cancers at levels much lower than the standards permitted for the nuclear industry.*

We also show that there are inexpensive, renewable sources of energy we can draw on. These alternatives could provide more jobs — and energy — at lower costs — and without endangering us or the world we live in.

WHAT IS NUCLEAR POWER?

The heart of a nuclear power plant is the reactor core, where uranium fuel pellets in thousands of long, finger-thick metal tubes are surrounded by water. As uranium atoms split apart, they release energy which boils the water. The resulting steam runs a turbine generator to make electricity. In this process, huge amounts of radioactive waste are produced. A large nuclear reactor may contain several tons of this waste — possessing 1,000 times more radioactivity than the kind of atomic bomb dropped on Hiroshima or Nagasaki.

If a pipe carrying water to the reactor core breaks, emergency cooling systems must begin working immediately and flawlessly to keep the core from overheating. If these systems fail, a "meltdown," or loss of coolant accident would occur. In such an accident, the core would become so hot that it would melt, cracking the cement, and releasing deadly radioactivity into the air. This was the type of accident that was suggested in the movie, "China Syndrome", — and the kind that nearly happened at the Three-Mile Island plant near Harrisburg.

A "meltdown" could be caused by any number of events, ranging from earthquakes to design mistakes to deliberate sabotage. The consequences of such a meltdown accident would be as horrifying as those resulting from a nuclear war. According to a study by the Atomic Energy Commission, 45,000 people could die immediately, 100,000 more could be severely injured, and an agricultural area the size of Pennsylvania could be irreversibly contaminated. Additional cancers would begin to show up fifteen or twenty years later, as they have in Nevada and Utah; and genetic damage would become apparent in future generations, as they have in Japan. Eventually, the death toll could reach to hundreds of thousands.

YOUR POWER COMPANY REGRETS THE RECENT NUCLEAR MELT DOWN AND WOULD LIKE TO POINT OUT THAT NOBODY'S PERFECT...
YOUR POWER COMPANY
PUBLIC SERVICE Co.
WELL - BACK TO THE OLD DRAWING BOARD!

THE DIABLO CANYON NUCLEAR PLANT

Along a beautiful stretch of coastline 12 miles south west of San Luis Obispo sits the Pacific Gas and Electric Company's Diablo Canyon power plant. Two reactors, totaling 2212 megawatts, were to be finished in the mid-70's at a cost of $350 million. To date, the utility has spent $1.6 billion — and if the switch is thrown, much of that price tag would be charged to ratepayers.

In the first licensing hearings on Diablo Canyon in 1967, the utility confidently claimed that the nearest important earthquake fault was the San Andreas, 48 miles away. They ignored the warnings of California Polytechnic Institute geologist Ralph Vrana about the possibility of a fault zone just offshore from the plant site.

In 1970, citizen intervenors asked that a thorough study of the area be done before construction of the plant proceeded. PG&E and the regulatory agencies turned down the request; and instead of conducting geological studies, PG&E invested $400,000 in promoting Diablo Canyon and nuclear power. By 1973, the presence of a large, active offshore fault — just two and a half miles from the Diablo site — was officially confirmed by the United States Geological Survey (USGS). By this time, however, over one-third of the plant was completed and millions of dollars invested.

Now, in 1979, the plant has been completed and the NRC hearings have ended. Independent geologists such as Dr. Clarence Hall of UCLA, as well as the USGS, have found that the Hosgri fault is linked to the San Andreas and is capable of producing a 7.3 earthquake. The Diablo plant has been "reinforced" to withstand an earthquake of only 6.7. Further studies indicate that the Hosgri is also connected to the San Grygori fault, thus creating an earthquake potential of 8.9! Conservative and liberal geological estimates establish an earthquake potential that is 10-50 times[1] more powerful than the Diable plant has been reinforced to withstand. What is more, PG&E has done nothing to reinforce the pipes, welds, pumps, or pressure vessels that make up the reactors themselves!

The performance of PG&E and the regulatory agencies make it clear that the controversy is something more than a scientific squabble. According to a 1976 NRC memo made public by the *Los Angeles Times,* the NRC was reluctant to deny an operating license for Diablo "because of the large financial loss involved and the severe impact such action would have on the nuclear industry." The Advisory Committee on Reactor Safeguards, a branch of NRC, admitted they would have applied tougher standards on Diablo construction if they had known about the magnitude of the earthquake danger — but said there are "offsetting factors that lead to an acceptance of an already completed plant." The ACRS also reasoned that "population density around the Diablo Canyon site is low." 12 miles away, in San Luis Obispo, live 45,000 people.

NUCLEAR POWER UTILITIES IN CALIFORNIA

In their attempts to promote nuclear power in California, utility companies have consistently disregarded public safety and common sense. For 30 years the nuclear utility industry has tried to site nuclear plants near major earthquake faults.

Beginning in 1958, PG&E tried to build a nuclear plant on Bodega Head, about 50 miles north of San Francisco. A six-year battle ensued before PG&E gave up. Even the Atomic Energy Commission expressed doubts about the earthquake safety of this site, only a *thousand feet* from the San Andreas fault. PG&E experts strongly defended the Bodega Head site as being located on solid granite, but a subsequent geological boring showed it to consist of 60 feet of silt, clay and sand.

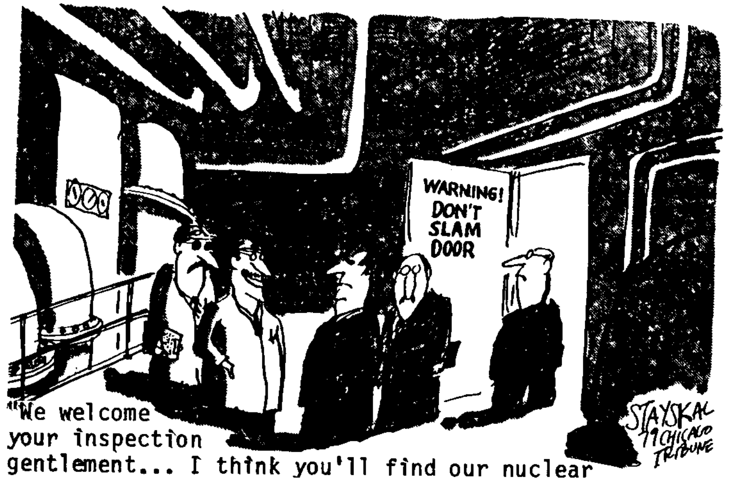
PG&E's most "successful" commercial nuclear reactor is the small plant located at Humboldt Bay. From the time the plant started up in August 1963 through June 1971, it was forced to shut down 35 times due to malfunctions. An employee at the Humboldt plant, Robert Rowan, was fired by PG&E after he formally complained to the Atomic Energy Commission about continued violations of radiation release standards. In one incident, Rowan discovered that radiation dosimeters near the elementary school just south of the plant were registering contamination levels higher than the instruments could accurately measure. The Humboldt plant was permanently closed in 1976 because of an earthquake fault *running directly underneath it.*

In the East Bay near Pleasanton PG&E and General Electric combined efforts in building the "Vallecitos Nuclear Center". One of the reactors there has been shut down many times because Vallecitos is surrounded by earthquake faults. Vallecitos reactors have been polluting the water supply for the residents of Newark and Fremont for years.

Rancho Seco, owned by the Sacramento Municipal Utility District, has been shut down 36 times in the few years it has been operating. Currently, Rancho Seco is shutdown because it is a twin model of the Three-Mile Island plant, designed by Babcock and Wilcox.

San Onofre, sandwiched between Los Angeles and San Diego, also lies between two major earthquake faults. San Onofre has been shut down on several occasions because of problems with emergency core cooling systems. So far, emergency core cooling systems, which are designed to prevent meltdown, have failed in over ninty percent of the tests they've been given.

Building Diablo Canyon near an earthquake fault is not a mere accident — nor simply an isolated but costly blunder by Pacific Gas and Electric. It is one of many mistakes made by the nuclear utility industry in California. The ultimate consequences of such mistakes may be catastrophic.



"We welcome your inspection gentlement... I think you'll find our nuclear

HARRISBURG AND PUBLIC SAFETY

It does not take an earthquake to make things go wrong at nuclear power plants. On Wednesday, March 28, at four in the morning, a series of mechanical failures and human errors at the Three-Mile Island plant in Harrisburg led to a major accident. Large amounts of radiation, in the form of radon gas, were released into the atmosphere. At the time of the accident, backup cooling systems were out of order and reactor operators had not been told. The oversight was one of the determining factors in putting Three-Mile Island (TMI) just hours away from a major meltdown, an accident that would have killed thousands and permanently contaminated much of Pennsylvania.

Although no one can pinpoint exactly what went wrong, public safety was definitely not the top priority of the utility that operated TMI. Metro Ed should never have permitted the plant to operate while backup cooling systems were not functioning properly. In fact, a similar accident had occurred at TMI two weeks before the major disaster but was not made known to the public. Strong evidence also suggests that safety systems had not been responding correctly when Metro Ed obtained a license to operate on December 30, 1978. If licensed a few days later, Metro Ed would not have qualified for $40 million in tax write-offs or a rate increase of over $49 million. It seems more than coincidence that one third of all nuclear power plants in the U.S. have been licensed in December.

People were not warned of the accident at TMI for several hours. Pregnant women and small children were not evacuated for two days.

Margarette Trunk was one ot eleven persons appointed by President Carter to evaluate the accident. Demanding to know why people were not evacuated at the time of the accident, she discovered there were no specific evacuation plans. Nearly 75% of all nuclear power plants, including Diablo Canyon, do not have specific evacuation plans designed for major nuclear accidents.

The Nuclear Regulatory Commission did not know how to "accommodate" the accident at TMI. The hydrogen bubble that formed at the top of the reactor was the result of a simple chemical change of water into the gases oxygen and hydrogen; and yet not one of all the nuclear engineers in the industry had foreseen this kind of reaction. A hydrogen bubble is much more dangerous than a meltdown in that a meltdown gives you some time to get people out of the way. But a hydrogen explosion that ruptures the containment will be instantaneous and carry death in the wind.

Dr. Ernest Sternglass, professor of radiological physics at the University of Pittsburgh believes that the government is covering up the actual doses of radiation the people around the plant were exposed to. He reported that "The government had no instrumentation in place to measure the steam that escaped into the atmosphere at the start of the Harrisburg disaster." Gases that are inhaled when fission products pass by in a cloud of steam produce a dose about 130 times greater than the dose absorbed by the body from external gamma radiation. Sternglass concludes that, "although the NRC has cited maximum accumulated doses as being 80 millirems, the true maximum doses to the lung may have been as large as 10,000 millirems." The difference in these conflicting figures means that instead of 0.5-50 cancer deaths occurring, based on government figures, 300-2,500 may actually result.

Metro Edison's concern with profit above public safety is inexcuseable. And yet, will they be held accountable? So far, the party that *is* held responsible is the government — or, rather, the tax-payers. The government, through the Price-Anderson Insurance Act, covers nuclear accidents for up to $560 million. Government studies indicate costs could run as high as $17 billion, thus making the nuclear industry liable for less than 2% of potential damage costs of a major nuclear accident. TMI costs are already equalling the $560 million limit. We cannot expect nuclear safety when companies operating nuclear plants are not accountable for major accidents caused by their own mistakes.